

The effects of adult learning on self-efficacy¹

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We use quantitative and qualitative methods to investigate the links between participation in adult learning and self-efficacy, particularly for the subgroup of adults who had low levels of achievement at school. We focus on self-efficacy because it translates into a range of wider benefits and because it may afford protection from depression and other forms of social exclusion. Quantitative analyses of data from the National Child Development Study (NCDS) provide evidence for an association between taking courses and transformations in self-efficacy for all cohort members, but the association is greatest and the evidence is strongest for our subgroup. A related fieldwork project involving in depth interviews with 15 women with poor school attainment sampled from the NCDS provides insights into some of the processes that underlie the associations found: (i) perceptions of achievement in adult education increase self-efficacy; (ii) adult education leads to more challenging occupations, which build self-efficacy; (iii) resistance to participation in adult education is reduced as self-efficacy increases; and (iv) learning on the job can build self-efficacy, and although participation in employer-provided training courses does not appear to play an important role, it reflects engagement in occupations where the value of learning is recognized. The interviews also illustrate how school impacts on self-efficacy and motivation to learn throughout the life course, and how important background and life circumstances can be in shaping the impacts of adult learning on self-efficacy.

Introduction

This paper concerns the links between participation in adult learning and self-efficacy, particularly for that subgroup of adults who had low levels of achievement at school. We suggest that adult learning may play an important role in contributing to positive changes in self-efficacy during adulthood, for adults generally and for this subgroup.

We assess the evidence for an association between taking courses and transformations in self-efficacy for women with poor school attainment who were born in 1958

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in Britain. Women with poor school attainment are at risk of social exclusion and depression, and transformations in their self-efficacy may protect them from these risks and help them to move forward. In order to find out more about the processes that underlie the association and, in particular, whether participation in adult learning contributes to transformed self-efficacy, we use evidence from a qualitative study of members of the same subgroup (women with poor school attainment) about relationships between lifelong learning and well-being. This evidence complements the quantitative findings by providing information about the complex processes which underlie the associations.

Self-efficacy concerns perceived control over important life circumstances. It is not a measure of the skills a person possesses but concerns the beliefs that they have about what they can do under different sets of conditions with whatever skills they possess (Bandura, 1997, p. 37). Self-efficacy may be global, relating to general feelings of control over life, or specific, for example, in relation to educational success or being able to drive a car. Bandura argues that self-efficacy in the more global sense promotes well-being in a variety of domains. He summarizes theories and empirical evidence that suggest that perceived self-efficacy feeds into our cognitive processing (how we think), our motivations and how we deal with emotions. Through these mediators, self-efficacy has important effects on health through the adoption of healthy practices (see Kickbusch, 1990; Whitty *et al.*, 1998) and through helping individuals to cope effectively with stressful circumstances, which protects the biological systems that promote health and disease (see Bandura, 1997, pp. 259–279). More specifically, Bandura suggests that self-efficacy plays important roles in protection from the development of anxiety disorders, depression and dependency on drugs, as well as in their treatment; in the management of pain, athletic performance, the enactment and fulfillment of occupational roles, creative productivity and effective social relationships (*ibid.*).

In this paper, we refer to adult learning as any learning during adulthood that is taught by instructors or self-taught, but which is intentional. The quantitative analyses are restricted to measures of adult learning used in the survey, which ask about participation in taught educational courses. We refer to such participation as adult education. We use the broader definition for adult learning in our analyses of the qualitative evidence, because we think that self-efficacy and motivation to learn may differ in their relationships with formal provision (adult education) and less formal learning, particularly for our subgroup of women with poor school attainment.

We hypothesize that adults with relatively high levels of self-efficacy are more likely to engage in learning, and also that the experience of adult learning raises levels of self-efficacy. Thus, we expect to find associations between participation in adult learning and levels of self-efficacy that reflect a two way dynamic interaction between learning and self-efficacy. Findings from quantitative analyses of British cohort data suggest similar two-way relationships between adult education and other health and social capital outcomes. Adult education appears to be an important element in positive cycles of development and progression (Feinstein & Hammond, 2004).

In the context of the two-way relationship which we think underlies any associations found between adult learning and self-efficacy, qualitative research conducted at our Centre found evidence that participation in adult learning developed self-efficacy for some individuals. This wide-scoping but in depth qualitative study, involving biographical interviews with 145 respondents, found that confidence was a very commonly reported effect of adult learning (Schuller *et al.*, 2002, 2004). Confidence differs conceptually from self-efficacy because it encompasses self-worth. However, Schuller *et al.* give a schematic list of the wider benefits that flowed from greater confidence, and several of these could be described as the manifestations of increased self-efficacy (see Figure 1, below).

Schuller and his colleagues suggest that adult learning both transforms (i.e., improves) and sustains (conserves) a range of positive outcomes, including self-efficacy. Transformation:

... is most commonly reported and celebrated, quite reasonably, for example in the accounts gathered across the country during Adult Learners' Week (ALW). But we point to a very important conservation effect, where education prevents decay or collapse (at individual and community level), in addition to those instances where it brings about change of a more or less dramatic kind. (Schuller *et al.*, 2002, p. 12)

We refer to the conservation effect of education as sustaining. How this effect was manifested differed depending on the life circumstances of the respondent. Several

<p>Individual</p> <ul style="list-style-type: none"> - to draw on and make sense of their own personal experience; - to put forward their own views*; - to acknowledge mistakes*; - to confront problems rather than hide from them**; - to challenge the views of others*; - to ask for help*; - to accept the views of others even though these may differ from their own; - to accept the views of others even though this entails them changing their own viewpoint; - to put themselves in unfamiliar situations*; - to communicate more effectively with professionals, notably on health or education matters*; - to communicate more effectively within family or personal relationships*; - to make themselves available to others, e.g. as a problem-solving resource*; - actively to offer help to friends, neighbours or family**; - to perform more effectively in their different social roles, i.e. generally to raise their levels of social competence and contribution*; - to take on new roles and responsibilities in the family and community*. <p>Collective</p> <p>* Added by authors to indicate benefits that are most easily understood as manifestations of increased self-efficacy</p>

Source: Schuller *et al.* (2002)

Figure 1. Benefits flowing from greater self-confidence derived from participation in adult learning

respondents in Schuller *et al.*'s study were women struggling to maintain their well-being and sense of identity whilst caring for small children and often parents and in-laws as well, and they reported that taking courses stopped them from 'going under'. For other respondents, notably those with learning or mental health difficulties, taking courses was a necessary part of their support system, as participation sustained their social involvement and a positive sense of purpose and well-being. Respondents who led fulfilling lives took courses to further enrich their lives, which sustained a high level of well-being and self-efficacy. Whether the effects of adult learning were more sustaining or transforming seemed to depend on whether the respondent was learning at a period in their lives characterized by change or discontinuity (when learning had more transforming effects), or at periods of stability (when learning effects were more sustaining; see Hammond, 2004). Therefore, in our investigations of the links between participation in adult learning and self-efficacy, we distinguish between transformed and sustained self-efficacy.

Again relating to the same two-way relationship, other evidence suggests that those with relatively high self-efficacy have greater motivation to participate in adult learning. For example, theories of motivation stress the importance that individuals attach to feeling that they will be successful in the given task (see Eccles *et al.*, 1997; Bandura, 1997). This means that those who have high levels of self-efficacy in relation to a particular form of learning are more likely to participate in it. It also implies that adults with low self-efficacy in relation to their schooling (e.g., those with poor school attainment) will be less motivated to participate in adult learning if it reminds them of school.

Thus, we have reasons to think that members of our subgroup—adults who attained poorly at school—have relatively low motivation to participate in formal adult education. However, if these adults do engage in adult education, there is the potential to raise self-efficacy in relation to education and probably other domains also from low starting points. Increased self-efficacy translates into a range of wider benefits (Bandura, 1997; Schuller *et al.*, 2002), and may afford protection from depression and other forms of social exclusion. That is why it is so important to consider whether adult education does bring benefits in terms of increased self-efficacy for this group, and if so, what interventions might increase their motivation to participate in the first place. The answers to these questions are unlikely to be the same for all members of this diverse subgroup.

The links between adult learning and self-efficacy are probably manifold and complex, changing throughout the life course. Our quantitative analyses use a dataset that does not have many repeated measures of participation in adult education and self-efficacy and so we cannot unpick the causalities that underlie any associations found between taking courses and self-efficacy. However, we can test whether associations exist between participation in adult education and transformed and sustained self-efficacy, and estimate how strong they are. In order to gain some understanding of the processes that underlie them, we are very fortunate in being able to use qualitative evidence from another project. This involved interviews with women with poor school attainment about learning and well-being throughout their lives. Their accounts

complement the quantitative findings because they provide insights into the processes and possible causal pathways that underlie the associations found in the quantitative analyses. Findings from the two approaches (quantitative and qualitative) provide indicators about how best to use adult learning to promote self-efficacy for women with poor school attainment, and also how to develop interventions that promote self-efficacy to motivate participation in adult learning.

To summarize, the research questions addressed are:

1. Is participation in adult learning related to transformed or sustained efficacy?
2. Are relationships found for men and women with poor and good school achievement?
3. What are the causal pathways that underlie any relationships found?

The next section describes the quantitative research, and the following section describes findings from the wider qualitative project that investigated relationships between adult learning and well-being within a life course perspective (Hammond, mimeo). The final section draws together the findings from the two approaches and discusses our conclusions.

The quantitative project

Data and methods

We use data from the National Child Development Study (NCDS). This is a survey of all those born in the UK between 3–9 March, 1958; 17,733 mothers had live babies during that week and 17,415 completed the initial survey. Additional information was collected about the cohort members at ages 7, 11, 16, 23, 33 and 42, the last survey being completed in 2000. During childhood, information was collected from the cohort members' parents or carers, schools and health visitors. Medical examinations and cognitive tests were carried out, and data were collated from the examination boards. Since the beginning of the 1980s, the surveys have been completed by the cohort members themselves. The dataset thus provides enormously rich longitudinal information for a very large number of individuals born in Britain.

We estimate associations between participation in adult education and the probabilities of transformed and sustained self-efficacy between the ages of 33 and 42, conditional on a set of measures for background and childhood factors and life circumstances at age 33. In order to do so, we compare the odds of having sustained (or transformed) self-efficacy between 33 and 42 for those who participated in adult education over the same period compared to the rest of the cohort, who did not participate in adult learning over this period. This comparison is summarized by an odds ratio.²

The odds ratio takes a value of one if the odds of having sustained (or transformed) self-efficacy is the same regardless of whether or not cohort members took courses between the ages of 33 and 42. If the odds of having sustained (or

transformed) self-efficacy are greater for those who took courses than they are for those who did not, then the odds ratio takes a value greater than one and if the odds are smaller for those who took courses than for those who did not, then the odds ratio takes a value less than one. We use logit analyses to deal with the fact that our dependent variables (sustained or transformed self-efficacy) are binary. In the results we report the odds ratios and p -values.³

We conduct these analyses for the whole cohort. We then separate the cohort members into two subgroups based on school attainment (whether they had any O level equivalents at age 16) and conduct the same analyses for each group. Summary statistics of the binary variable used to divide the cohort members in this way, and of the variables described in the rest of this section, are given in the appendix. Nearly all (92%) of those without O levels or their equivalents left school at age 16. This group also had relatively deprived family backgrounds and poor health.

Because we think that the relationships between participation in adult education and self-efficacy may be different for men and for women, we also conduct these analyses separately for men and women.

The models used estimate correlations. These can be explained by a combination of three types of causality; (1) effects of adult education on self-efficacy; (2) confounding bias; and/or (3) effects of changes in self-efficacy on participation in adult education, i.e., reverse causality. We address the problem of confounding bias by introducing controls in our models. These include measures at age 7 for family and social background, child attainment and health, and age 33 measures of socio-economic status, qualifications, family and employment status and well-being. They are described in more detail in the next section. There is little that we can do to assess the extent to which reverse causality accounts for any correlations found because we do not have precisely dated information about the sequences of events.

We do not believe that our controls exclude all sources of selection bias (i.e., confounding bias and reverse causality). Therefore we are cautious in drawing causal inferences from our findings. The results are nevertheless useful, especially when supplemented by the qualitative evidence.

Eleven thousand, four hundred and nineteen cohort members out of the original 17,415 participated in the last sweep of the survey in 1999. From previous sweeps, we have information about who does not take part in subsequent sweeps. Hawkes and Plewis (in press) use a variety of statistical techniques to identify the differences between cohort members who responded and cohort members who did not respond at each sweep. They conclude that there is some consistency to the pattern across the models fitted. Non-respondents tend to be male, have relatively low educational attainment, have relatively unstable employment patterns and live in relatively disadvantaged circumstances. Non-respondents therefore differ systematically from respondents and we cannot assume that they are missing *completely* at random. This implies that we should be cautious about generalizing findings from analyses of the respondents in the NCDS to the rest of the cohort. However, Hawkes *et al.* find that only 10% of the variance in attrition is explained by information available from prior sweeps which suggests either that attrition is mainly explained by unknown and

unobserved factors or that it is predominantly random. If there are important unobserved factors that explain attrition and these are strongly correlated with health and education then they could lead to bias in the findings here. However, it seems more likely that the residual attrition is random and so not a cause of substantive bias.

Measures

Summary statistics of the measures used are reported in the appendix.

Participation in adult education

Participation in adult education is measured using an indicator of whether the cohort member took any taught courses between the ages of 33 and 42, i.e., between 1991 and 2000. This measure gives participation rates that are consistent with other British surveys (see Feinstein *et al.*, 2003, pp. 17–19). Using this measure, well over half (58%) participated in adult learning between the ages of 33 and 42, with similar levels amongst men and women. Although we use the binary variable here, experiments drawing on more detailed aspects of adult learning such as number of courses taken or course type give similar results (see Feinstein & Hammond, 2004, for information on these more detailed measures).

Self-efficacy

The measure of self-efficacy is derived from three items present in the surveys at ages 33 and 42, in which the cohort member chooses which statement out of a pair is more true for them:

- I never seem to get what I want from life.
- I usually get what I want out of life.
- I usually have a free choice and control over my life.
- Whatever I do has no real effect on what happens to me.
- Usually I can run my life more or less as I want to.
- I usually find life's problems just too much for me.

Most cohort members choose the more positive statement in all three instances; 72% do so at age 33 and 73% at age 42. We create a binary variable to indicate high self-efficacy, with those who choose the positive statement all three times taking a value of 1.

Sustained self-efficacy only applies to the 7463 cohort members who have relatively high self-efficacy at age 33. It takes a value of 1 if self-efficacy is also relatively high at age 42 and a value of 0 if at age 42, self-efficacy is low. Seventy-five per cent of the 7463 cohort members who had high self-efficacy at age 33 also have high self-efficacy at age 42; 25% do not. A slightly higher proportion of the women than the men with high self-efficacy at age 33 also have high self-efficacy at age 42. See Table 1.

Transformed self-efficacy applies to the 2930 cohort members with relatively low self-efficacy at age 33. This is a smaller sample than the sample for sustained

Table 1. Percentages of men and women in the cohort with transformed and sustained self-efficacy between the ages of 33 and 42

	Men		Women	
	Sustained self-efficacy	Transformed self-efficacy	Sustained self-efficacy	Transformed self-efficacy
0	27.5	62.5	23.5	56.5
1	72.5	37.6	76.5	43.6
No. obs.	3576	1494	3886	1435

self-efficacy since a high proportion of the cohort had high self-efficacy at age 33. Transformed self-efficacy takes a value of 1 if the cohort member has high self-efficacy at age 42, and a value of 0 if at age 33, the cohort member still has low self-efficacy. A slightly higher proportion of the women than the men with low self-efficacy at age 33 have high (transformed) self-efficacy at age 42. See Table 1.

Controls for social, family, cognitive and biological factors

The control variables used encompass social and family risks, health factors and cognitive ability up to the age of 7-years, with additional controls for social, economic and family circumstances and health and well-being at age 33. Summary statistics are given in the appendix.

We include seven family risk factors, which proxy for a wider range of background characteristics that might predict both participation in adult learning and changing self-efficacy during adulthood. Attainment at 7-years is measured using test scores and teacher assessments. The childhood health variables include measures derived from an instrument devised by Rutter *et al.* (1970) to measure social and emotional adjustment based on a parent's perceptions of the child. Adjustment at school is assessed using the Bristol Social Adjustment Guide (BSAG) (Stott, 1966).

At age 33, we control for socio-economic status based on occupation and the Registrar-General's schema, in five categories with manual semi-skilled and unskilled combined. Academic and vocational qualifications are measured separately using levels specified in DfES guidelines, based on the qualifications framework set out by the Qualifications and Curriculum Authority. We control for age 33 self-efficacy as well as other measures of well-being, namely satisfaction with life so far, optimism, malaise and self-rated health, labour market status and family type by creating dummy variables that describe sixteen groups of individuals depending on these criteria.

Quantitative findings

The estimated odds ratios for sustained and transformed self-efficacy contingent on participation in adult learning are given in Table 2, below. We give odds ratios for the subgroups of cohort members with poor and good school attainment at age 16.

Table 2. Odds ratios for sustained and transformed self-efficacy between the ages of 33 and 42 contingent on participation in adult education over the same period

Group	Model		Sustained self-efficacy	Transformed self-efficacy
Whole cohort	No controls	OR	1.35	1.33
		<i>p</i>	(0.000)	(0.000)
		<i>N</i>	6619	2480
	Full controls	OR	1.10	1.36
		<i>p</i>	(0.181)	(0.001)
		<i>N</i>	6618	2479
Cohort members with O level equivalents at 16	No controls	OR	1.3	1.31
		<i>p</i>	(0.004)	(0.022)
		<i>N</i>	4270	1222
	Full controls	OR	1.07	1.36
		<i>p</i>	(0.484)	(0.026)
		<i>N</i>	4269	1217
Cohort members without O level equivalents at 16	No controls	OR	1.25	1.3
		<i>p</i>	(0.028)	(0.021)
		<i>N</i>	2349	1258
	Full controls	OR	1.17	1.43
		<i>p</i>	(0.157)	(0.007)
		<i>N</i>	2337	1256

The odds ratios and *p*-values are estimated from separate logit regressions for the whole cohort, for each subgroup, for the two models (with and without controls), and for sustained or transformed self-efficacy. *P*-values are given in brackets and the number of observations included in each logit is given underneath the *p*-value. Note that the number of observations used to estimate odds ratios for transformed self-efficacy are smaller than the number used to estimate odds ratios for sustained self-efficacy. See text for definitions of sustained and transformed self-efficacy and for details of the controls.

Table 2 shows that transformed self-efficacy was more likely for those who took courses than for those who did not. For example, the odds of having transformed efficacy are 1.33 times greater for those who took at least one course between the ages of 33 and 42 than they are for those who took no courses over the same period (*p*<.0005). When controls are added, the odds ratio hardly changes (OR=1.34, *p*=.001.) This result holds for those with poor school attainment as well as for those with better school attainment.⁴

Table 2 shows that we have no evidence to suggest that the odds of having sustained self-efficacy are any different for the cohort members who did or did not take courses between the ages of 33 and 42.

Table 3 gives the odds ratios contingent on participation in adult learning for men and women separately and for the two subgroups that we have distinguished on the basis of their school attainment.

The odds ratios and *p*-values are estimated from separate logit regressions for each subgroup, model and for sustained or transformed self-efficacy. *P*-values are

Table 3. Odds ratios for sustained and transformed self-efficacy between the ages of 33 and 42 contingent on participation in adult education over the same period for men and women separately

Group	Model		Sustained self-efficacy		Transformed self-efficacy	
			Women	Men	Women	Men
Whole cohort	No controls	OR	1.42	1.28	1.33	1.35
		<i>p</i>	(0)	(0.009)	(0.012)	(0.009)
		<i>N</i>	3479	3140	1253	1227
	Full controls	OR	1.09	1.12	1.39	1.32
		<i>p</i>	(0.430)	(0.272)	(0.017)	(0.034)
		<i>N</i>	3478	3134	1252	1223
Cohort members with O level equivalents at 16	No controls	OR	1.27	1.31	1.29	1.33
		<i>p</i>	(0.067)	(0.035)	(0.112)	(0.097)
		<i>N</i>	2295	1975	647	575
	Full controls	OR	1.00	1.14	1.26	1.44
		<i>p</i>	(0.993)	(0.360)	(0.270)	(0.086)
		<i>N</i>	2294	1971	644	571
Cohort members without O level equivalents at 16	No controls	OR	1.41	1.14	1.37	1.28
		<i>p</i>	(0.022)	(0.374)	(0.056)	(0.118)
		<i>N</i>	1184	1165	606	652
	Full controls	OR	1.29	1.15	1.73	1.24
		<i>p</i>	(0.157)	(0.398)	(0.010)	(0.251)
		<i>N</i>	1169	1162	603	648

given in brackets and the number of observations included in each logit is given underneath the *p*-value. See text for definitions of sustained and transformed self-efficacy and for details of the controls. The results suggest that even after controlling for background and current factors, the odds of having transformed self-efficacy are greater for both men and women who took courses between the ages of 33 and 42. The odds ratio is greatest for women with poor school attainment (based on a test of the interaction term).

The qualitative project

Interpretation of the quantitative findings is informed by complementary evidence from a qualitative study. This study was designed to investigate the individual and social characteristics that women with poor school attainment bring to adult learning which affect participation, engagement and receptivity to wider benefits, especially in terms of well-being. The findings provide valuable insights into the complex and manifold processes throughout the life course that link participation in adult learning to changing levels of self-efficacy. They relate to our third research question: What are the causal pathways that underlie any relationships found (between participation in adult learning and transformed or sustained self-efficacy)?

Methodology

Sampling

Fifteen women with poor school attainment (no O level equivalents at age 16) were sampled from the NCDS. In order to further focus the qualitative study on issues of social disadvantage, the author selected women whose fathers had manual occupations when they were born and who themselves had manual occupations at age 33. They were all aged 46 when they were interviewed in 2004.

Data collection

The interviews were conducted using a topic guide. The aim of each interview was to help the respondent to talk about the topics in the guide with as little direction from the interviewer as possible. Therefore, the order in which topics were discussed was flexible and there were no pre-set questions.

Respondents talked about their family background and childhood, their experiences at school, formal and informal learning throughout adulthood and their emotional and physical health and health behaviours. The interviews lasted for about an hour and a half. They took place in the respondents' homes and were tape recorded.

Analysis

Immediately after each interview, the interviewer wrote about 2000 words reflecting on the respondent's story and its relevance to the research questions. She also checked the respondent's NCDS record to check that what they reported in the interview matched the data from the survey. No contradictions were found.

The interviews were transcribed and analysed using a combination of analytic and inductive approaches with the software package NVivo 1.2. The categories that were applied to the data were very broad and consequently many additional categories emerged during the analysis.

All names have been changed to protect the anonymity of the respondents.

Qualitative findings

The qualitative findings provide a database useful for better understanding the associations between transformed self-efficacy and taking courses between the ages of 33 and 42, particularly for women with poor school attainment. To set the scene, we summarize themes that emerged from the 15 women's accounts about the impacts of school on self-efficacy and motivation to learn. We then describe four processes that may underlie the association between participation in adult learning and transformed self-efficacy for this subgroup, and two types of barrier to positive impacts of adult learning on self-efficacy.

Impacts of school on self-efficacy and motivation to learn

Amongst women with poor school attainment, we expect the impacts of school on self-efficacy and motivation to learn to be extremely diverse, and so it is very unlikely that the accounts of the 15 women interviewed capture the full range. Even within the 15 accounts, there is great diversity in school impacts, depending on background, personality, early life circumstances and events, and the types of school attended. We summarize these briefly.

Some respondents enjoyed academic learning at school and felt they had been successful. These were the respondents who left school with the CSE qualifications that they and their teachers had expected to achieve. They were confident in their academic abilities and did not appear to have fears about taking adult education courses.

Several respondents had poor literacy, which had held them back from attempting certain occupations as well as from participating in adult learning. Most of these women, and others with higher levels of skills had low confidence in their abilities to succeed both educationally and more generally, and these feelings related to experiences at school. For example:

A couple of them [the teachers] used to say, 'Oh you'll grow up to be ... you'll be nothing. You'll do nothing with your life'. And I think when you get something like that put in your head, I think you go through your school life thinking that. (Emma)

It is because at school you think, 'God ...' You're gonna be a failure. Cos they drum it into you that you're gonna be. That you're not gonna get anywhere, you're not gonna do anything. (Helen)

I used to think that I wouldn't wanna speak in certain circles cos I was inferior, I suppose. I didn't think that anyone would want to listen to anything I had to say. And I think I did carry around the fact that I'd gone to this really dreadful school. (Louise)

Lack of confidence contributed to fears that demotivated adults from taking courses. Being shown to fail in front of other pupils contributed to fears of being 'shown up' in any new setting, especially an educational one. In addition, negative social experiences at school had lasting effects; for example, women who had been called fat or bald at school reported feeling self-conscious in an educational setting, and this was another barrier to participation.

Nevertheless, almost all the respondents reported that learning was an important part of their lives. Those who did not report engagement in learning had a recent history of depression. The respondents were engaged in learning through watching TV documentaries, talking with friends, reading, knitting, sewing, gardening and attending spiritualist groups, which were not explicitly educational. For some, work provided opportunities to learn (on the job as opposed to through courses), and these women talked enthusiastically about the challenges they met at work. Thus, there was a genuine interest and engagement in learning, but not in forms that were reminiscent of school.

Those who had attended adult education courses had done so initially through encouragement or coercion. Some respondents had to attend courses to keep their

welfare benefits, and some were coerced or strongly encouraged to participate by their employers. Others took their first course with friends and relatives. Although many respondents enjoyed these courses and progressed to others, none had attended their first adult education course without some encouragement and support, as described here.

Processes underlying the association between adult learning and transformed self-efficacy

Four processes which explain why adult learning is related to transformed self-efficacy emerged from the 15 accounts.

1. Perceptions of achievement in adult education can increase confidence and self-efficacy.

This finding emerges from the accounts of three respondents, Betty, Louise and Emma.

Betty was one of seven children; her parents were both alcoholics and she spent two years in care. Both her mother and her teachers at school told Betty that she was slow and would not achieve much in life. However, she describes herself as someone who doesn't give up. She passed her driving test after seven attempts, learned to ride a bicycle when she was 20, and completed a diploma in nursery nursing in her early 40s. She was aware of her success on the diploma course because she acquired new skills and understanding, she received praise from her teachers and obtained reasonable marks as well as her certificates. The feelings of success in learning gave her confidence in her abilities and a tremendous sense of pride. The confidence and understanding that she had developed also enabled her to communicate more effectively with her daughter's teachers when her daughter was having problems at school.

Louise is academically very able but left school before she was 16-years-old to live in a commune. When her children were small, a friend coerced her to enroll on a course leading to an O level in English. She was reluctant to enroll because she felt she would be a failure, but in fact she got top marks. Delighted with her success, she enrolled on an A level course, and later on an Open University degree course. Again, she obtained very high marks and consequently discovered that she was not, after all, inferior to the rest of her class, most of whom were articulate and well-educated. The course opened up a new world for her and she applied for an interesting and well-paid job as a forensic psychologist.

Emma described herself as 'thick' at the beginning of the interview, a description that she had been given by her teachers at school. When her children had grown up, the Job Centre sent Emma on a back-to-work course. This involved reflection about how school had undermined her confidence and helped to build her belief in her abilities. This contributed to her decision at the time of the interview to enroll on a one-year City and Guild's course in computing.

2. Resistance to participation in adult learning is reduced as self-efficacy increases. The accounts of Louise, Katie and Emma illustrate this finding.

As Louise's confidence in her abilities grew through her evident success in the courses she took, so did her motivation to participate in more courses. Thus, for Louise the relationship between increasing self-efficacy and taking courses reflects both effects of participation on self-efficacy and also effects of increased self-efficacy on motivation to take another course.

Katie is dyslexic, but this was not recognized at school and she was repeatedly told that she was 'thick'. She has little confidence in her academic abilities, particularly because she has problems reading and writing, and consequently, she is not motivated to attend formal courses. However, she has progressed in her work from being a voluntary helper at her children's school to working in the office, where she manages the register and school meals, and even types the occasional letter. Her success in managing her responsibilities at work have increased her sense of self-efficacy and, with her employer's encouragement, she has attended two first aid courses.

Emma, who was also told by her teachers that she was 'thick', developed greater confidence through her involvement in a spiritualist group. Here, she learned to read tarot cards and was told that she would make a good counselor. This idea has stayed with her. Her self-efficacy in relation to her abilities had increased prior to the interview through the back-to-work course described above, and in her abilities to do computing through playing with her boyfriend's computer at home. On the day that she was interviewed, Emma had enrolled on a one-year City and Guilds course in computing. Part of her motivation was to acquire literacy skills so that she could progress on to a course in counseling.

3. Success in adult learning can lead to more challenging occupations, which build confidence and self-efficacy. The accounts of Louise, Belinda and Emma illustrate this finding.

Louise's degree gave her the confidence and motivation, as well as the qualification she needed to apply for a job as a forensic psychologist. Her success in this job contributed to increases in her self-efficacy. For example, she gave up smoking using a technique she was teaching at work. She says that although the technique was useful, she would never have tackled her smoking were it not for the confidence she had gained through her course and job because she wouldn't have thought she could succeed.

Belinda took an IT course and as a result obtained an office job managing drivers in a dispatch company. This job involved much more administrative responsibility than any she had done before, and although she found it stressful, she was amazed that she could do it and had gained enormous confidence in her abilities. Belinda explained that she will now tackle things that previously she would have left to her husband, for example, paying and querying bills and organizing deliveries of furniture to the house.

After her children left home, Emma was out of employment but caring for her mother and her confidence was not very high. She was sent on a back-to-work course and as a result obtained employment in a recycling factory. This employment helped her to feel more in control of her life.

4. *Learning on the job can build self-efficacy, and although participation in employer-provided training courses does not appear to play an important role, it reflects engagement in occupations where the value of learning is recognized.* This finding emerges from the accounts of Kerry, Katie, Heather and Bernice. I use Heather's story to illustrate it.

Heather did not get on well at secondary school because she liked to argue with the teachers and they did not appreciate her. She feels that what she learned from school was how to play the system, because at school she obtained reasonable marks and kept the teachers happy with her despite doing very little work and attending rarely. She left school with a just enough qualifications to get jobs in offices.

Heather sees learning as central to her life but describes herself as a 'hands-on learner'. She has learned through work in a series of careers. Her first job was in an office, where her employers recognized her potential and gave her opportunities and responsibilities. Typically, Heather progresses as far as she can in one occupation and then moves onto another, starting near the bottom. When she was interviewed, Louise was a Human Resources Manager.

She has attended numerous employer-provided courses. However, what has built her self-efficacy and developed her enthusiasm to take on new and greater challenges is her success at work together with the support and guidance that she has received from her managers.

Barriers to positive impacts of adult learning on self-efficacy

Comparisons between accounts, but in particular the accounts of a few respondents (Helen, Alison and Carol) illustrate how important (i) background; and (ii) life circumstances can be in shaping the impacts of adult learning on self-efficacy and other social and economic outcomes.

1. *Importance of background in shaping impacts of adult learning on self-efficacy.* This finding is illustrated by the accounts of Alison, Carol and Helen. We use Helen's account because her background was particularly difficult for her.

Helen grew up in poverty as one of nine children. She helped her mother by taking many domestic responsibilities from an early age, for which she received no thanks. The school was very small and the teachers did not like her family. Despite working hard, she was constantly undermined, both at home and at school. Her childhood comes across as deprived and harsh, and probably as a result, Helen fears new environments because 'they might find out how useless I am'. She has suffered periods of anxiety and depression throughout adulthood.

After leaving school, Helen was encouraged by an acquaintance who was a nurse to try auxiliary nursing. Her abilities were quickly recognized and she was put on a course to become a nurse. She was highly successful in her studies and adored the work. However, soon after qualifying she married and stopped working.

At the time of the interview, Helen's children had left home. She had a job cleaning industrial machines. She talked about how she would love to return to nursing

and how this was now a practical option. The main reason why she has not returned to nursing is that she is frightened of starting something new with people she doesn't know; she fears that she will in some way be 'shown up'. As a consequence of these fears, to which Helen's background contributes, she has not made use of her nursing qualification or fully enjoyed the potential benefits of this part of her education.

2. Importance of life circumstances in shaping impacts of adult learning on self-efficacy.

This finding is illustrated by the accounts of Helen, Alison and Carol. We use Carol's account to illustrate it.

Carol's second husband was the love of her life, but he became an alcoholic and used to beat her up. Partly in response, Carol started to drink heavily herself (the beatings didn't hurt so much). She described herself during the interview as a 'recovering alcoholic'. At this stage, Carol was struggling to keep a job managing an old people's home and she attended several courses provided by her employers. These did little for her sense of self-efficacy however, because, as she says herself, at this stage in her life she was totally overwhelmed by the acute difficulties in her personal life.

Carol joined AA, managed to stop drinking and left her husband. She moved away from the area where she had lived all her life to get away from her husband and had been slowly rebuilding her life. She planned to take a course soon. We think it is likely that Carol will derive more benefits from adult learning and this stage in her life than she experienced as a result of the employer-provided courses that she attended when her marriage was breaking down.

Conclusions

Our analyses of the 1958 cohort data found a relationship between taking courses and transformed self-efficacy. The evidence is particularly strong for women with poor school attainment, a group at risk of depression and other forms of social exclusion, for whom increased self-efficacy may afford protection and a way forward. The qualitative evidence provides insights into the complex processes that underlie the associations found. We have included the qualitative evidence alongside the quantitative because it captures very well the individual heterogeneity and complexity of the processes that underlie the quantitative findings.

Although the quantitative analyses provide evidence about associations, we are cautious in drawing any causal inferences from this evidence alone. We controlled for many potential causes of confounding bias, but are aware that many others are likely to remain. Because the NCDS has no information about timings of changes in self-efficacy or participation in adult education other than the measures we have used at ages 33 and 42, it is not possible to examine how changes in self-efficacy pre- and post-date participation in adult education.

Rather to our surprise, we found no evidence of associations between taking courses and sustained efficacy, either for the whole cohort or for any of the subgroups. In other words, cohort members who had high self-efficacy at age 33

were no more likely to sustain this high level of efficacy at age 42 if they had taken courses over this period than if they had not. The previous fieldwork research found that for some respondents, participation in adult education had sustained their well-being and social involvement (Schuller *et al.*, 2004). Perhaps this applies to a minority of the cohort who were experiencing difficulties, or who had specific problems such as learning difficulties or a history of mental health problems. Any such effects were not identified as statistically significant in our quantitative analyses, which look at relationships averaged out over the whole cohort.

The difference in findings between sustained and transformed self-efficacy is not due to differences in statistical power related to differences in sample sizes. The size of the sample used to estimate the odds ratios for transformed self-efficacy contingent on participation in adult learning is in fact smaller than the sample size used for the equivalent estimated odds ratio for sustained self-efficacy. Thus the test of the sustained effect has greater likelihood of finding statistically significant effects, yet it is the transformation effect that emerges more strongly.

Nevertheless, we are cautious in drawing conclusions about the different contributions of adult learning to transformed as opposed to sustained self-efficacy. The measures used for sustained and transformed self-efficacy are based on binary variables for self-efficacy at ages 33 and 42 derived from just three questions (at each age). Most cohort members gave positive responses to these questions and so the measures lack discrimination. The positive answers may reflect response bias due to people telling the interviewer what they think makes them sound normal. This would introduce measurement error.

Associations between taking courses and transformed self-efficacy, conditional on background factors and current life circumstances, are found for both men and women and for those with good and poor school attainment. When we examine the evidence for these conditional associations for the four separate subgroups—men and women with poor and good school attainment—we find that the evidence is particularly strong for women with poor school attainment.

Other studies (Gotlib, 1981; Cutrona & Troutman, 1986; Kavanagh & Wilson, 1989; Olioiff *et al.*, 1989; Marshall & Lang, 1990) have shown that efficacy protects against depression and other mental health problems, as well as other aspects of social exclusion (Eden & Aviram, 1993; Mittag & Schwarzer, 1993). It has also been shown that those who leave school with few qualifications are particularly likely to have low efficacy in adulthood (Hammond & Feinstein, *in press*). Thus, low efficacy is probably a channel for the social exclusion effects of leaving school with few qualifications. To some extent adult education is a potential remedy for these processes. We find in this paper that low efficacy may be transformed by participation in adult education.

The qualitative evidence highlights some of the complex processes unfolding over time that may partially explain this finding. The evidence is subjective on two counts: first, because it is based on the subjective accounts of respondents telling their stories retrospectively. Second, these accounts are analysed and interpreted by researchers who are interested in the findings and who, however hard they may try

not to, inevitably bring their expectations and perspectives to the research. Nevertheless, the accounts are clear and especially where several respondents tell similar stories, we have confidence in our findings, if interpreted appropriately.

Some women with poor school attainment (and it is important to emphasize that we don't know how many) become engaged in a positive spiral of growing self-efficacy and progression that bears on their personal development, family and social relationships, and occupational lives. Taking courses appears to play an important part in this process because as self-efficacy increases, so does motivation to take on new challenges including participation in more challenging courses. Success in learning builds confidence in one's cognitive and social abilities and widens occupational opportunities. New occupational challenges and progression in this domain also contributes enormously to positive self-efficacy.

Almost every woman interviewed was motivated and engaged in some form of informal learning, for example, reading, watching TV documentaries, craftwork, involvement in groups that were not explicitly educational, and commonly and for some women very importantly, through learning opportunities at work. It would be interesting to know whether transformed or sustained self-efficacy is associated with these kinds of informal learning. Many respondents were deterred from taking courses because formal educational provision reminded them of frightening experiences at school, especially being shown to fail in front of classmates.

Some aspects of informal learning, such as learning at one's own pace in a non-competitive environment with one-to-one support and guidance are captured in current provision such as Learn Direct, which is targeted towards learners who did not achieve highly at school. Policy-makers who wish to help women with poor school attainment to progress in their personal and occupational lives may find it useful to understand better how and why these women are motivated and engaged in informal learning. They may also be able to capitalize on the enthusiasm and interest that women with poor school attainment already have for many types of informal learning.

The women interviewed took on new challenges, which promoted their self-efficacy only when other responsibilities allowed them to. Many of those interviewed had been limited (as well as, in some cases, fulfilled) by domestic responsibilities and/or personal issues, and they only became motivated and engaged in learning (including self development) at times in their lives when they were ready to do so. Others were fulfilled in lives that often involved informal and unpaid caring and they did not appear to wish for personal or occupation changes, even if others might see such changes as beneficial. Thus, we do not think that adult learning is a general panacea that everybody needs at all stages of life. Nevertheless, it is important to provide opportunities for learning which adults can take advantage of when they are ready and receptive. For example, family learning is provided for parents when their children are becoming more independent and this could, and often does lead to progression in learning (Brooks *et al.*, 1997; Bastiani, 1999; Lewis, 2000; Ofsted, 2000).

For many respondents, negative school experiences and deprived family backgrounds had limited their confidence to try out anything new. Such adults may be motivated to learn in a familiar and safe setting with others who share features of

their lives, for example in a family learning setting. In addition, adults lacking confidence may require support and guidance to help them to use what they have learned in ways that improve their lives. This may be important for initiatives that aim to help women (like Helen) back into nursing careers.

In conclusion, our key finding is that at certain stages in their lives, some adults—and we have focused here particularly on women with poor school attainment—become engaged in positive cycles of progression which involve participation in adult learning and increasing levels of self-efficacy. This promotes well-being, health and social inclusion. Adult learning appears to play an important role in these cycles because as self-efficacy increases, so does motivation to take more challenging courses, and engagement in these courses not only develops self-efficacy, but it also promotes social relationships, broadens horizons and widens occupational opportunities. However, as the qualitative findings show the causal processes underlying these life course changes are complex and not uni-directional. Thus, we do not seek to attribute causality to adult learning in the sense of claiming it as a magic bullet or policy panacea. It is important to recognize the potential of lifelong learning as an intervention but this recognition must also be linked to understanding of the importance of appropriateness of the learning to the lives of the learners if delivery is to be such as to realize the potential benefits.

Notes

1. The research presented here was funded by the Department for Education and Skills. However, all errors and omissions remain those of the authors.
2. The odds ratio for transformed self-efficacy contingent on participation in adult learning is summarized using this formula:

$$\frac{p(\text{transformed SE} \mid \text{participation in AL}) / p(\text{transformed SE} \mid \text{no participation in AL})}{p(\text{no transformed SE} \mid \text{participation in AL}) / p(\text{no transformed SE} \mid \text{no participation in AL})}$$

The odds ratio for sustained self-efficacy uses the same formula with sustained instead of transformed self-efficacy.

3. The *p*-values represent statistical significance. Technically, they describe the probability of rejecting a true null hypothesis and therefore express the degree of confidence with which we can make inferences. *P*-values below 0.05, for example, indicate statistical significance at 95% confidence.
4. The odds ratio for transformed self-efficacy contingent on participation in adult learning is greater for those with poor school attainment than for those with better school attainment. In order to test whether the difference is statistically significant, we conducted an additional logit analysis using the whole cohort but introducing an interaction term. The odds ratio for this interaction term compares the odds ratios for transformed self-efficacy contingent on participation in adult learning between those with poor and good school attainment. The model is summarized below:

$$\log(OR) = \alpha + \beta_1 AL + \beta_2 S + \beta_3 AL * S + XB + \epsilon$$

Where α is a constant, AL is participation in adult learning, S is school attainment, XB is a vector of control variables, and ϵ is the error.

There was no evidence that the estimated odds ratio (β_3) was different from one, indicating that the odds ratio for the subgroup with poor school attainment was not significantly different to that of those with better school attainment.

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Appendix 1. Summary statistics for the variables used in the quantitative analyses

	Obs	Mean*	SD	Min	Max
<i>Outcome variables</i>					
Sustained self-efficacy 33–42	7463	.75	.44	0	1
Transformed self-efficacy 33–42	2930	.40	.49	0	1
<i>Subgroup indicator</i>					
No O levels or equivalent quals at 16	14,331	.53	.50	0	1
<i>Participation variable</i>					
Participation in adult learning 33–42	9,852	.58	.49	0	1
<i>Control variables</i>					
<i>Family and social background</i>					
Father sc 4,5, sick or unemployed at birth	16,513	.22	.41	0	1
Born to mother under 20	17,402	.06	.23	0	1
Mother left school at min age	17,355	.75	.43	0	1
3+ children under 21 in household at 11	13,790	.56	.5	0	1
Father left school at min age	14,051	.77	.42	0	1
Free school meals at 11	13,955	.10	.30	0	1
Father absent at 0, 7 or 11	12,629	.14	.35	0	1
<i>Childhood health</i>					
1+ health condition at 7	14,302	.31	.46	0	1
1+ condition constituting handicap at 7	14,302	.04	.20	0	1
1+ sensory defect at 7	14,133	.18	.38	0	1
1+ sensory defect constituting handicap 7	14,053	.00	.04	0	1
Danger of becoming overweight at 7**	14,544	.23	.42	0	1
Medium Rutter parent score at 7	14,544	.32	.47	0	1
High Rutter parent score at 7	13,535	.15	.36	0	1
<i>Attainment at age 7</i>					
Poor oral ability at 7	15,017	.22	.41	0	1
Limited knowledge at 7	15,008	.28	.45	0	1
Poor or non-;reader at 7	14,993	.26	.44	0	1
Little or no creativity at 7	15,001	.33	.47	0	1
Slow at numbers at 7	15,013	.35	.48	0	1
Bottom quartile reading test at 7	14,931	.26	.44	0	1
2nd quartile reading test at 7	14,931	.26	.44	0	1
3rd quartile reading test at 7	14,931	.29	.45	0	1
Bottom quartile arithmetic test at 7	14,898	.29	.45	0	1
2nd quartile arithmetic test at 7	14,898	.28	.45	0	1
3rd quartile arithmetic test at 7	14,898	.24	.43	0	1
Bottom quartile drawing test at 7	14,648	.28	.45	0	1
2nd quartile drawing test at 7	14,648	.27	.44	0	1
3rd quartile drawing test at 7	14,648	.22	.42	0	1
<i>Adjustment at 7</i>					
BSAG score 1–5 at 7	14,932	.39	.49	0	1
BSAG score 6+ at 7	14,932	.51	.50	0	1

	Obs	Mean*	SD	Min	Max
<i>SES and qualifications in adulthood</i>					
Professional occupation at 33	11,407	.04	.20	0	1
Managerial or technical occupation at 33	11,407	.26	.44	0	1
Skilled non-manual occupation at 33	11,407	.19	.39	0	1
Skilled manual occupation at 33	11,407	.16	.36	0	1
Occupation missing at 33	11,407	.14	.34	0	1
No academic qualifications at 33	11,407	.13	.34	0	1
Academic quals below 5 O equivalents at 33	11,407	.15	.36	0	1
Academic quals equivalent to 5 Os at 33	11,407	.35	.48	0	1
Academic quals equivalent to 2 As at 33	11,407	.09	.29	0	1
Academic quals equivalent to degree at 33	11,407	.11	.32	0	1
Academic quals missing at 33	11,407	.14	.35	0	1
No vocational qualifications at 33	11,407	.38	.49	0	1
Vocational quals at level 1 at 33	11,407	.11	.31	0	1
Vocational quals at level 2 at 33	11,407	.12	.32	0	1
Vocational quals at level 3 at 33	11,407	.10	.30	0	1
Vocational quals missing at 33	11,407	.14	.35	0	1
<i>Demographic group</i>					
Single male, no child, not working	11,407	0.02	0.14	0	1
Single male, no child, working	11,407	0.08	0.28	0	1
Single male, with child, not working	11,407	0.00	0.04	0	1
Single male, with child, working	11,407	0.01	0.07	0	1
Male with partner, no child, not working	11,407	0	0.07	0	1
Male with partner, no child, working	11,407	0.08	0.28	0	1
Male with partner, with child, not working	11,407	0.02	0.14	0	1
Male with partner, with child, working	11,407	0.27	0.45	0	1
Single female, no child, not working	11,407	0.01	0.09	0	1
Single female, no child, working	11,407	0.05	0.22	0	1
Single female, with child, not working	11,407	0.02	0.14	0	1
Single female, with child, working	11,407	0.02	0.16	0	1
Female with partner, no child, not working	11,407	0.01	0.09	0	1
Female with partner, no child, working	11,407	0.06	0.24	0	1
Female with partner, with child, not working	11,407	0.12	0.33	0	1
Female with partner, with child, working	11,407	0.21	0.41	0	1
Demographic group missing	11,407	0.01	0.12	0	1
<i>Adult health and well-being</i>					
Self-efficacy at 33	10,393	2.58	0.77	0	3
Satisfaction with life so far at 33	10,629	7.42	1.72	0	10
Optimism at 33	10,565	8.53	1.41	0	10
Self-rated health at 33	11,274	2.68	0.6	1	3
Malaise score at 33	11,327	2.4	2.97	0	22

*For binary variables, the mean represents the proportion of individuals in the sample for whom the variable takes a value of one. Multiplying the proportion by 100 gives the percentage of individuals in the sample for whom the variable takes a value of one.

**Over 85th percentile by gender.